from a mixture of DNA fragments. To acquire information concerning the sequence of a PCR product, the DNA microarray hybridization, which is a sequence-based detection method, has been integrated into PCR microfluidics platforms. However, the use of DNA microarrays has some problems in terms of reproducibility and reliability due to the fact that the DNA probes are fixed on electrodes. [1]

[0008] Overall, gel-based genotyping assays such as PCR-restriction fragment length polymorphism (RFLP) analysis, oligonucleotide ligation assay genotyping, and mini-sequencing are relatively straightforward and are useful when dealing with a small number of samples. The methods are labor-intensive and require experienced and skilled technical staff for final analysis. Although gel-based genotyping methods are still widely used in many laboratories, they are difficult to apply to high-throughput genotyping in large-scale pharmacogenetic studies. [2]

[0009] Next Generation Sequencing (NGS) has made significant strides in the past few years. Three NGS technologies available are Roche **454**, ABI SOLiD, and Illumina. These technologies vary considerably in terms of throughput, read-lengths, and cost, which is in the thousands of dollars per sample. Both the Illumina and Roche **454** platforms share the underlying principle of 'sequencing by extension' used in the Sanger methodology (single bases complementary to the template molecule are sequentially added to a nascent strand and their identity determined by chemical means). The ABI sequencing technology uses a unique chemistry whereby oligonucleotides complementary to a series of bases in the sequencing template are ligated to a nascent molecule and the identity of the first two bases of the ligated oligonucleotide is specified by a degenerate four color code (each color specifies four different dinucleotides).

SUMMARY OF THE INVENTION

[0010] Pandora Genomics provides a ready-made solution to make the drug discovery process and clinical use of drugs more efficient and cost effective. The handheld, point-of-care device can integrate sample collection, testing, and intuitive results reporting to facilitate the integration of genetic information into clinical research and care. The technology is easy to implement, has a quick turnaround time, can be located on-site, and can eliminate the need for trained technicians and the need to send samples to a centralized reference laboratory. The device can save money for pharmaceutical companies, patients, and insurance companies by improving the chances of success in drug approval and by reducing hospitalization costs associated with adverse drug events.

[0011] The present invention provides a method for evaluating samples or analytes using a point-of-care device. A test selection is received from the user interface. A determination is made whether a test cartridge connected to the test cartridge interface matches the test selection. One or more properties of the sample or the analyte are detected using the one or more detectors or sensors. Test results data based on the one or more properties is generated. A report based on an analysis of the test results data is generated and the report is provided to the user interface. The foregoing method can be implemented as a computer program embodied on a non-transitory computer readable medium for execution by a computer or processor such that the steps are implemented as one or more code segments.

[0012] In addition, the present invention provides a POC device that includes a housing, a power supply disposed within the housing, a memory disposed within the housing, a user interface attached to or integrated into the housing, one or more communication interfaces disposed within, attached to or integrated into the housing, a test cartridge interface disposed within, attached to or integrated into the housing, one or more detectors or sensors disposed within the test cartridge interface or the housing to detect one or more properties of a sample or an analyte and generate test results data based on the one or more properties, and one or more processors disposed within the housing and communicably coupled to the memory, the user interface, the one or more communication interfaces, the test cartridge interface and the one or more detectors or sensors. The one or more processors receive a test selection from the user interface, determine whether a test cartridge connected to the test cartridge interface matches the test selection, receive the test results data from the one or more detectors or sensors, generate a report based on an analysis of the test results data, and provide the report to the user interface. The test results data evaluate nucleic acids, proteins, metabolites, carbohydrates, lipids, chemicals, normal eukaryotic cells, diseased eukaryotic cells, tissue, bacteria, fungi or viruses.

[0013] The present invention also provides a system that includes one or more point-of-care devices, a set of test cartridges, and a remote server computer accessible by the POC device via a network. The POC device includes a housing, a power supply disposed within the housing, a memory disposed within the housing, a user interface attached to or integrated into the housing, one or more communication interfaces disposed within, attached to or integrated into the housing, a test cartridge interface disposed within, attached to or integrated into the housing, one or more detectors or sensors disposed within the test cartridge interface or the housing to detect one or more properties of a sample or an analyte and generate test results data based on the one or more properties, and one or more processors disposed within the housing and communicably coupled to the memory, the user interface, the one or more communication interfaces, the test cartridge interface and the one or more detectors or sensors. Each test cartridge is configured to perform a specified test on the sample or the analyte. The one or more processors of the POC device receive a test selection from the user interface, determine whether a test cartridge connected to the test cartridge interface matches the test selection, receive the test results data from the one or more detectors or sensors, generate a report based on an analysis of the test results data and data from the data storage, and provide the report to the user interface. The test results data evaluate nucleic acids, proteins, metabolites, carbohydrates, lipids, chemicals, normal eukaryotic cells, diseased eukaryotic cells, tissue, bacteria, fungi or viruses.

[0014] The present invention is described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The above and further advantages of the invention may be better understood by referring to the following description in conjunction with the accompanying drawings, in which:

[0016] FIG. **1** is a block diagram of a system and apparatus for evaluating samples or analytes in accordance with one embodiment of the present invention;